

## Claims

1. An imaging system (1) for imaging a document, comprising a support surface (12) for a document (30) to be imaged, a light stripe projector (4) arranged to project a plurality of diverging sheets of light (48) that extend from the projector (4) towards the support surface (12) for forming a series of stripes (35) across the document (30), a camera (2) having a detector array (22) for capturing an image (31,33) of the document (30) and of light stripes (35) projected onto the document (30), a processor (25) arranged to receive (23) from the detector array (22) data representative of images (31,33) of the document (30) and of the light stripes (35) and to calculate therefrom a three-dimensional profile of the document (30) relative to a reference surface, characterised in that the relative divergence of adjacent sheets of light (48) varies laterally across the sheets (48) so that the stripes (35) are concentrated where the divergence is relatively low (56).

2. An imaging system (1) as claimed in Claim 1, in which at least one of the sheets of light (51,53) is non-planar with a variable divergence from an adjacent sheet.

3. An imaging system (1) as claimed in Claim 2, in which there is a planar sheet of light (52) with diverging sheets (51,53) either side of the planar sheet (52).

4. An imaging system (1) as claimed in Claim 3, in which the diverging sheets (51,53) bow towards the planar sheet (52).

5. An imaging system (1) as claimed in Claim 4, in which the sheets of light (48) are symmetric about a plane that is transverse to the planar sheet (52) and which comprises a median ray (49) of the planar sheet (52).

6. An imaging system (1) as claimed in any preceding claim, in which the camera (2) and light stripe projector (4) are mounted together on a support (6) that rises above an edge (10) of the support surface (12).

7. An imaging system (1) as claimed in Claim 6, in which the light stripe projector (4) is below the camera (2).

8. An imaging system as claimed in any preceding claim, in which the light stripes are individually indistinguishable, and the imaging system includes means for identifying individual stripes by labelling the series of stripes.

9. An imaging system as claimed in any of Claims 1 to 7, in which the light stripes are made individually distinguishable by spatial modulation.

10. A method of imaging a document (30) using a document imaging system (1) comprising a support surface (12), a light stripe projector (4), a camera (2) having a detector array (22), a processor (25), in which the method comprises the steps of:

- i) placing the document (30) on the support surface (12);
- ii) using the light stripe projector (4) to project a plurality of diverging sheets of light (48) that extend from the projector (4) towards the document (30);
- iii) arranging the light stripe projector (4) so that the sheets of light (48) fall on the document (30) to produce a series of light stripes (35) on the document (30);

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iv) using the camera (2) to capture with the detector array (22) an image (31,33) of the document (30) and of light stripes (35) projected onto the document (30);

5 v) sending (23) from the detector array (22) to the processor (25) data representative of the captured image (31,33) of the document (30) and of the light stripes (35); and

10 vi) using the processor (25) to calculate therefrom a three-dimensional profile of the document (30) relative to a reference surface;

characterised in that the light stripe projector (4)  
15 projects adjacent sheets of light (48) with a relative divergence that varies laterally across the sheets so that the stripes (35) are concentrated on the document (30) where the divergence is relatively low (56).